

Chapter IV

INTERPRETIVE SIGNS

A. Introduction: This chapter discusses interpretation in general and provides “how to” information about interpretive signs. It is not intended to be a comprehensive discussion of a very complex communication process. Rather, it provides some very basic guidance to noninterpreters faced with an interpretation project or task. This section may best serve to encourage a professionally trained resource specialist or a professionally trained public affairs specialist to seek the aid and counsel of a professionally trained interpretive specialist.

B. Definitions and Concepts:

1. Interpretation is a communication process designed to reveal meanings and relationships of our cultural and natural heritage to the public through firsthand involvement with facilities, objects, artifacts, landscapes, and sites. Interpretation does much more than just provide facts. Interpretation tells a story and brings meaning and interest to a subject for the enjoyment of the visitor.
2. Interpretive signs communicate specific messages to visitors. These messages can be written to change behavior, educate, or evoke an emotion in the reader. They are most commonly used for self-guided trails and for wayside exhibits at points of interest, such as viewing areas and resource management areas. They can be constructed of many different materials and are mounted so they are visible to all viewers.
3. Interpretive signs provide communication services to visitors. Interpretive signs support management objectives, tell a story, and reveal meanings of and relationships among built, manipulated, natural, cultural, and other natural resource features. The program’s main components are orientation, information, and interpretation. The program functions as a customer service tool, a management tool, and a public awareness tool.
4. To be “interpretive,” the communication process should be based on the principles articulated by Freeman Tilden (see appendix 2). Interpretation should:
 - a. Provoke the attention or curiosity of the audience.
 - b. Relate the message to the everyday life of the audience.
 - c. Reveal the essence of the subject through a unique viewpoint.
 - d. Address the whole. Show the logical significance of an object to a higher level concept or story line.

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- e. Strive for message utility. Use a sufficient but varied repetition of cues to create and accentuate a particular mood, theme, aura, or atmosphere.

5. Interpretive Signs:

- a. Use a combination of well-written text and professional graphics to convey a message.
- b. Increase visitor enjoyment through appreciation and understanding of features, concepts, themes, and stories of the natural, cultural, created, managed, and historic environments.
- c. Explain management of public land resources.
- d. Guide or modify visitor behavior to reduce visitor impacts to resources or facilities.

C. Interpretive Signs in Relation to Other Media:

1. Advantages.—

- a. More visitor contacts than other types of media.
- b. Relatively inexpensive in terms of cost per visitor contact.
- c. Consistent message to many people at one time and can be viewed at the visitors' convenience.
- d. In place at all times and available to visitors 24 hours a day.
- e. Long-term value, since visitors' photos tell the story long after the visit.

2. Disadvantages.—

- a. Impersonal - contacts by employees are much more effective.
- b. Communicate one-way and may become outdated.
- c. No tangible "take home" value except for the visitors' photographs of them.
- d. Draws attention to a fragile resource which, in turn, may be damaged or destroyed through inappropriate behavior of visitors.
- e. Vulnerable to damage by weathering, decay, wildlife, and vandalism.

D. Planning: Interpretive sign planning is a process that requires detailed interdisciplinary participation, including the use of interpretive specialists (see appendix 3).

1. Need.—Consider the following in determining the need for interpretive signs:

- a. Is there something visitors can see, smell, or hear at the area that needs explaining?
- b. Is there something interesting in the area that visitors will probably miss if not interpreted?
- c. Will visitors get more from their experience if appropriate interpretive signs are provided?
- d. Is interpretive signing appropriate, or will some other method work better?
- e. Are there impacts or damage being caused by visitor use or behavior which can be alleviated by an interpretive sign?
- f. Will enough visitors see the sign to make it cost effective?
- g. Is interpretive signing consistent with the Recreation Opportunity Spectrum (ROS) class of the proposed area, if ROS is being used?
- h. Will people with disabilities be accommodated (reference ADAAG 4.30)?

If the answers are “Yes,” plan for the minimum number of signs needed to convey the appropriate message(s) in a professional manner. Too many signs reduce effectiveness.

2. Objectives.—State the objectives of the sign in writing. They should support the objectives and goals listed in the interpretive plan for the site or project area. When developing interpretive signs, consider agency and project objectives, as well as visitor expectations. For example, visitors to a particular site may want to learn something about an historic event that occurred there, or the agency may want them to be aware that sites are being preserved and studied through an ongoing cultural resources management program. Without satisfying both parties’ needs, an interpretive sign will be only partially effective. Clear objectives help to evaluate the effectiveness of the sign. Three levels of objectives should be addressed:

- a. **Educational:** What should the visitor KNOW?
- b. **Behavioral:** What should the visitor DO?
- c. **Emotional:** What should the visitor FEEL?

3. Example.—An agency observes that visitors to a campground are causing damage to trees at the site. A visitor profile reveals that the campsite’s predominant users are

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families with young children and teenagers who camp two to three times a year. The families live in an urban area and don't have much sensitivity to, or understanding of, the environment.

- a. The agency defines its objectives as follows:
 - (1) **KNOW:** The visitor will be able to identify three behaviors that cause injury to a tree.
 - (2) **DO:** The visitor will stop injuring trees in the campgrounds.
 - (3) **FEEL:** The visitor will respect trees as living organisms.
 - b. The agency's staff decides an interpretative sign will be the most effective medium. They choose to place it near a tree that clearly shows signs of vandalism. They construct the sign message as follows:
 - (1) **Artwork:** First drawing - Anthropomorphized tree wincing as a person hammers a nail into it to hang a lantern. Tree has bandages and scars on it; several branches are broken. Tree is not robust, looks sickly. Second drawing - Healthy, happy tree, radiant with good health and vigor.
 - (2) **Test:** *"Ouch! Like you, trees can get sick or be hurt. When bark is injured through such thoughtless acts as hammering nails, breaking branches, and carving, it allows easier entry for harmful insects and diseases, which may eventually kill the tree. Look at the oak tree behind this sign. Does it look healthy? What signs of injury do you see?"*

"Please help campground trees stay healthy by not hammering nails, carving bark, or breaking branches. You'll help them stay around a lot longer to provide shade and scenery, improve air quality, give wildlife homes, and protect soil from erosion."
 - c. The agency's staff considers supplementing the sign with other interpretive activities (self-guided or ranger led) for children and parents. The activities touch on outdoor skills and ethics to further emphasize the message and to enhance the public's awareness of trees.
- 4. Visitor Profile and Marketing Research.**—Describe the characteristics of the visitors who will be reading the sign, what they like, what their expectations are, and determine what visitors need to be satisfied. In most cases, the visitors should be asked about these needs, rather than the staff making assumptions. Seek assistance of someone who specializes in "service marketing."

This research should drive the entire interpretive planning process. Knowing who the visitors are and what they need allows staff to appropriately aim the messages at a particular target group for maximum effectiveness and customer satisfaction.

5. **Visitor Use Estimates.**—Determine the expected or preferred volume of visitation. This will be a major consideration in determining locations for sign placement, the size of the sign, and the complexity of the message. It will also help in deciding whether or not a sign is, in fact, needed or justified.
6. **Themes.**—A theme should be clearly stated and easily identifiable as the “thread” linking the various parts of the story to be told to the public. A major theme covers a related group of interpretive signs, such as a self-guided interpretive trail, route, or historic facility. Even a sign that will stand alone, such as the one described above, should have a theme.
7. **Design.**—Design is the final link between the visitor and information. Designs for interpretive signs should take into account:
 - a. Colors and images that will attract target visitors.
 - b. Keywords in headings and subheadings that will catch the visitors’ attention and provoke interest.
 - c. Type sizes and styles that will ensure easy readability.
 - d. Height and angle that will ensure comfortable head movement.
 - e. Reading level appropriate to the visitors.
 - f. Height, angle, and positioning that does not obscure the view of the subject being interpreted.
 - g. Sign contrast, lettering, and height will comply with ADAAG 4.30.
8. **Text.**—Language is one of our basic forms of communication. However, written text should be kept to a minimum for an interpretive sign. Text writing is complex. Text must be researched, written, edited, and proofread. Space for text is limited. It occupies a surprisingly large space when properly sized and laid out. Adequate letter size and spacing must be maintained to ensure readability. Also, text must be written at a level that is appropriate for visitors with a wide range of experience and education levels. Visitor interest in text is low. Research has shown that when text blocks exceed 50 to 75 words, visitor interest and attention decline rapidly. Text writing tips:
 - a. Use vivid language and active verbs.
 - b. To reach the widest range of people, write at a 7th- to 9th-grade level.
 - c. Use short sentences and paragraphs.
 - d. Be conversational.

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- e. Avoid technical jargon and clichés.
 - f. Avoid gender-specific language (i.e., for fisherman, use angler; for stockmen, use stock handlers).
 - g. Use upper and lowercase lettering for text. Use capitalization only for headings or for emphasis of a word or two.
9. **Examples.**—The following examples illustrate the difference between information text and interpretive text.
- a. ***Information:***
 - (1) PAINTBRUSH (*Castilleia miniata*). The Indian Paintbrush (or painted-cup) is a member of the Figwort family. The flower is an inch or more long, and the calyx tip is scarlet in color. Paintbrush usually grows in the mountains along streams and in wet places below 11,000 feet.
 - (2) Stalagmites, which rise from the floor when dripping water deposits minerals, are usually larger in diameter and more rounded on top than stalactites.
 - b. ***Interpretive:***
 - (1) There's no longer anything remaining of the old cookhouse, with its long table covered with a brightly colored tablecloth, where the miners ate three hearty meals a day. Imagine the breakfast-time aroma of fresh, hot coffee brewing and the sound of eggs and bacon sizzling on the grill. The miners were also served hot cakes, fried potatoes, and toast with homemade jam.
 - (2) Clark's nutcrackers have the habits of crows and the color of jays and are, in fact, cousins to both. The most forward of all birds, they will steal food off the picnic table from under your very nose.
10. **Graphics.**—Illustrations, maps, drawings, photos, colors, type styles, and general esthetics are all encompassed in the graphics development of an interpretive project. It is the combination of these elements that will attract and involve the visitor more than anything else. Use graphics to:
- a. Draw viewer attention.
 - b. Complement the text.
 - c. Enhance the understanding of the illustrated subject.
 - d. Tell a significant story visually.

11. **Organization Identification.**—The Reclamation emblem should be displayed on all interpretive and information signs. The identification should be an integral part of the sign design, and it should usually be subtle. Cooperators' and other appropriate logos, such as a reservoir logo, may also be included, but they, too, should be subtle and an integral part of the sign design.
 12. **Sign Layout.**—Skillful layout and design will provide high-quality signs for effective interpretation. Pay particular attention to the following:
 - a. ***Make the sign the right size:*** Consider the location and the distance from which the sign will be read. Letter size should provide easy legibility from planned viewing distances. (See Chapter V - General Design Guidelines, for size guidance.) Text and graphics are also factors in determining sign size. Consider using standard sign sizes for cost effectiveness. Make the sign no larger than necessary.
 - b. ***Allow the right amount of space around the text:*** The text should not be crowded. Leave enough space between blocks of text and headings and around the border for easy reading. Borders are also helpful to contain the graphics and copy.
 - c. ***Avoid diverting attention from the message:*** Design the support structure to blend and harmonize with the sign and the environment. Low profile signs, for example, should be used on overlooks. Although there are exceptions, interpretive signs are usually rectangular. Unusual shapes compete with the text.
 - d. ***Avoid distractions:*** Odd colors, awkward designs, unusual words, and overemphasis of symbols are examples of distractions.
- E. Construction Materials:** A variety of construction materials are available which, when properly used, have the potential to enhance sign effectiveness. Select sign materials based on appropriateness for the site, longevity, esthetics, cost, required maintenance, etc. Following is a partial list of available materials to consider:
1. **Anodized Aluminum.**—Also known as Duratone, Dura-Etch, and Novalloy. Very expensive, but its long life and low maintenance costs make the product cost effective. Very susceptible to scratching, but it is impervious to weather. Finish is in gold, bronze, or silver tones. Recommended locations would be in high visitor use areas. It is also the material of choice for recognition plaques. Can use photos in the process at extra cost.
 2. **Gator Foam.**—A Styrofoam board faced and backed with illustration board. Image and text are screened onto the paper face after it has been prepared with a coat of paint. Product is for temporary interior displays, presentations, and master plans. Light, durable, and attractive. If it is used outside, it should be enclosed in a

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moisture-proof case; however, other materials are better suited for exterior use. Will receive multiple colors, but no photos unless they are glued to the panels.

3. **High Impact Styrene.**—An extremely durable and attractive material best suited for interior use. Similar in quality to fiberglass, except the image and copy are screened on the opaque materials. Can be used for high traffic areas. Will withstand considerable abuse; however, surface of image and copy can be scratched if one works at it. Temperature and weather tolerant.
4. **Embedded Fiberglass.**—Also known as Modulite and Fibrex, it is a process that produces a screen print substrate encapsulated into layers of fiberglass. Available in multiple colors. It is an attractive sign that is very resistant to shattering, weathering, fire, and graffiti and can be applied to virtually any surface. Comes in 1/16-inch and 1/8-inch thicknesses.
5. **Masonite Silk Screen.**—Material comes in 1/4-inch Masonite that is silk screened in multicolor latex enamel. The material is inexpensive, but limited in its applications. Best for interior use in displays or cabinets. Any use outdoors requires a nonpermeable covering as well as a location out of direct sunlight.
6. **Photometal.**—Photometal is an aluminum alloy that is electronically treated to produce a colored, corrosion-resistant surface. It is available in various shades of aluminum, bronze, and gold. Excellent longevity. Weather resistant and relatively vandal resistant.
7. **Plexiglas.**—Common Plexiglas with the screened image on the reverse side. Fairly scratch resistant, but does become brittle with age and will shatter by point impact. Best suited for interior use.
8. **Polycarbonate.**—Also known as Lexan and Tuffak, polycarbonate is a clear material with impact strength about 250 times stronger than glass. It is ultraviolet stabilized and is available in a full range of colors. Comes in 10-, 50-, 75-, and 125-mil thicknesses. Similar to Plexiglas, but it is softer and will not shatter on point impact. A matte velvet finish must be ordered because the gloss finish is very susceptible to scratching. Suitable for either interior or exterior use. The thinner mil (10-23 mil) can be used on Masonite, metal, fiberglass, or other materials and is relatively inexpensive. Image is reverse silk screened. Resolution of the graphics and text suffers slightly in comparison with fiberglass-embedment process, but it is still considered a good product.
9. **Polyethylene.**—“Poly-Print” comes in 1/16-inch and 1/8-inch thicknesses. Durable and applicable to interior use. The low cost of this material makes it attractive for large multiple orders. Polyethylene does not do well outside and loses its image in direct sun.
10. **Porcelain Enamel.**—Also known as Dura-enamel and Enameltec. The process is a fired-on, opaque, glassy coating on metal. Infinite colors, gloss, semigloss, pebble,

or mottled finish are available. It has interior or exterior applications, especially in high visitation areas. It is very weather resistant and vandal proof, except it is easily shattered by bullets and excessive impact. One of the most attractive sign materials on the market. Cost is competitive with the rising costs of embedded fiberglass or metal signs. There is little or no maintenance.

11. Rigid Vinyl.—Material comes in 10-, 20-, and 30-mil thicknesses. Durable, but best used inside because exposure to the elements and ultraviolet rays tends to crack and warp it. Costs are low. Multiple colors can be used.

12. Screened Sign Board.—Direct screen printing on medium density overlay (MDO) sign board. Sheet size is ½ inch by 4 feet by 8 feet, which will make six 22-inch by 32-inch signs per sheet at a very moderate cost. Signs need to be primed and finish-coated with exterior enamel, then sent to a screen printer along with camera-ready artwork. Sign is ready to mount on uprights without having to attach it to a board.

F. Location and Placement: Location and placement of interpretive signs are critical to their effectiveness. Signs should be installed at locations with sufficient visitor traffic to warrant a sign, should be placed in view of the feature being interpreted, and should be accessible to persons with disabilities.

1. Consider the following when selecting sign sites.—

- a. Suitability of the view and environment and how it may be retained during construction, installation, and thereafter.
- b. Relationship of the sign to the point of interest. The point of interest should be obvious.
- c. Locate sign to enhance photographic value of the setting.
- d. Suitable parking.
- e. Availability of restrooms, water, and power.
- f. Locate where vandalism will not be encouraged.
- g. Esthetics of the location.
- h. Barrier-free accessibility.

2. Probable locations may be.—

- a. Active management and research projects.
- b. Overlooks and viewpoints.

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- c. Recreation facilities.
- d. Administrative sites.
- e. Unique natural features.
- f. Cultural sites (archeological sites, historic areas, and facilities).
- g. Areas where impacts are being caused by visitors.

3. Consider the following when determining proper sign placement.—

- a. Sun and glare.
- b. Shadows.
- c. Orientation.
- d. Protective shelter needs.
- e. Traffic hazards (vehicle or foot).
- f. Visitor safety, including barrier-free access.
- g. Mounting height and angle will vary, depending on a number of factors. Trail signs should be placed low, about hand level. This is convenient for both wheelchair users and visually impaired visitors. Tilt sign at about a 45-degree angle for ease in reading and rain runoff. Other signs, those designed to be read from a car, for example, may be more easily read at a 90-degree angle.
- h. Adverse effects of wind, insects, cold, heat, dust, bright sunlight, and other distracting elements to the visitor.
- i. Avoid danger or discomfort to the visitors as they approach or stand at the sign. For example, overhanging or dead limbs, dangerous walks, rolling rock, cactus near the trail edge, or rough stones in the trail.

- G. Special Considerations:** Design interpretive signs to provide for the needs of visitors with disabilities and foreign visitors who may have special needs. Consider the use of “curbside” information booths, cassette recordings, map brochure dispensers, two-way communications systems (vehicle to information counters), or other information devices, as feasible. Consult with the area specialist on how best to provide these services. If interpretive signs are provided, they must comply with accessibility standards such as ADAAG 4.30.

1. **Visitors with Disabilities.**—Most people who have vision impairments have some vision, even if they are legally blind. It is important to remember that fewer than 10 percent of the people with visual impairments read Braille. Many people choose to receive information by audio cassettes, large or raised print, or through oral presentations.

Do not set up signs or trails just for one certain group of people, such as “Braille trails” or “handicapped trails.” This assumes that people with disabilities need the protection of the special features, that there is nothing else in the site they would find interesting, and that nothing in the selected area is of value to the general public. Another problem with this type of developed site is that it requires visitors to identify themselves as being different from the rest of the visitor population.

Do not make assumptions about what visitors would like or are capable of doing. Many people with vision impairments are denied opportunities for experiences, such as scenic overlooks, merely because someone assumed they would not get much from the experience. With appropriate description, visually impaired people could enjoy a scenic overlook just as much as a sighted person.

Finally, it is most likely that a disabled person, like other visitors, will be traveling as part of a group. Like any visiting group, couple, family unit, or tour party, some of the visitors’ experience will be illuminated and enhanced by the discussion that goes on among the group members about what they are observing. The interpretive task, therefore, may not be to simply translate the common interpretive message for the disabled member of the party, but to provide a unique message, keyed to the disabled member’s abilities and to senses other than sight, that will allow the disabled member to bring his/her own insights to that dialogue.

2. **Tips.**—

- a. For visually impaired people, essential interpretive or orientation information that is provided in print should also be available through the spoken word, audiotapes, large or raised print (at least 1/4 inch), and, perhaps, Braille.
- b. Important text and graphics should be visible to all visitors.
- c. For greatest readability, characters and symbols should contrast with their backgrounds, either light characters on a dark background or vice versa.
- d. Self-guided trails should include such information as trail length, accessibility level, trail conditions, possible hazards, and cues for proper orientation. Interpretation should be as sensory as possible (e.g., “Feel the soil in a shady area and compare it to soil in a sunny area.”)
- e. Where appropriate, nonvisual cues should be used to inform and direct vision impaired people to signs. Tactile guide strips may be located to assist in travel.
- f. All pathways, ramps, aisles, and clearances should be accessible.

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- g. Railings and other barriers should be positioned to provide an unobstructed view to persons in wheelchairs.

- 3. **Bilingual Signing.**—Areas often visited by people whose predominant language is not English may need to include bilingual signing. If duplicate interpretive signs, one in English and one in non-English, are too costly and visually impacting, consider other alternatives, such as developing an interpretive brochure in the second or third languages. Text and graphics from the interpretive signs should be translated in the brochure.

- H. Evaluating/Monitoring Effectiveness:** Once a sign project is completed and installed, it must be monitored and evaluated as to its success in conveying the message to the intended audience and satisfying their needs. Whether the project involves one sign for a historic lookout, or a series of signs for an interpretive trail, the total effectiveness of the signs(s) must be evaluated (e.g., text, graphics, total communication presentation).

To evaluate interpretive signs, some marketing research techniques include in-house review, review by visitors, or review by experts. Area managers/specialists can consult with a marketer if they are unfamiliar with these techniques.

It is preferable to do test evaluations with signs prior to the fabrication stage. Time for the preinstallation evaluation should be built into the project development. Serious flaws discovered after fabrication and installation can require substantial funds, as well as time to repair. Preinstallation corrections will still take time, but are usually less costly.

To evaluate an interpretive sign's effectiveness, consider the following five criteria:

- 1. **Intrigue.**—Does it excite interest and curiosity? Does it capture the visitor's attention?
- 2. **Imagination.**—Does it communicate in innovative ways, and does it stimulate new and different ideas and concepts about the resource? Does it encourage the visitor to look at familiar things in different ways?
- 3. **Involvement.**—Does it invite or encourage visitor participation? Does it draw the visitor into intimate personal contact with things, so that he or she is more than a spectator?
- 4. **Information.**—Does it convey meaningful information or new knowledge about resources, their management, and the interplay of natural and cultural processes? Is it information the visitor needs if he or she is to feel satisfied about the visit?
- 5. **Influence.**—Will it effect significant changes in visitor attitudes or generate new ones?
- 6. **Accessibility.**—Is the information being communicated to the public available to persons with disabilities?

Chapter V

GENERAL DESIGN GUIDELINES

Design should be completed before the procurement process begins unless design preparation is to be completed under a scope of work as part of the procurement process. After selecting the general sign message, use the following guidance to determine the size and layout of all signs. Several sign components are similar and will be discussed together as they apply to all sign classifications outlined in chapter III. Some flexibility exists for regional diversity when designing signs that are compatible with the surrounding landscape and area themes. Use of native materials is encouraged when specifying particular design types. When deviating from these discretionary Guidelines, coordination with the regional sign coordinator is recommended.

Though the materials specified in these Guidelines are adequate for sign construction, there may be other materials and technologies which are superior and could be used. As funding permits, superior materials are recommended.

- A. Purpose:** This chapter provides a general overview of basic principles, standards, and guidelines that govern design and installation of signs. It also includes information on estimating sign sizes.
- B. Principles:** This chapter contains standards for sign design, shape, color, size, placement, and reflectivity. Specialists developing or using signs should follow these standards to portray a neat, organized appearance; to provide uniformity; to project a professional agency image; and to comply with laws and requirements of memoranda of understanding with Federal, State, and local agencies.

Specialists should consider use of symbols and/or non-English word messages to supplement English word messages on signs in areas that are frequented by non-English speaking visitors.

- C. Sign Objectives:** Design, locate, and maintain signs to:

- Fulfill an important need.
- Command attention.
- Convey a clear, positive, friendly, simple message.
- Generate respect.
- Give adequate time for viewer response.
- Identify Reclamation lands.

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D. Sign Design: Design of signs should ensure that:

- Such features as size, contrast, color, shape, composition, and lighting or reflectorization are combined to draw attention to the sign.
- Shape, size, colors, and simplicity of the message combine to produce a clear meaning.
- Legibility and size combine with placement to permit adequate time for viewing and response.

E. Standard, General Purpose Reclamation Signs: Standard, general purpose signs used on Reclamation lands should be either square or rectangular. Elongated rectangular signs, usually decals on posts, are acceptable. However, reading elongated text is difficult. Messages must be clear and concise. Except for elongated signs, where corners are square, all corners will be slightly rounded.

1. Traffic Control Sign Shapes.—The Federal Highway Administration and each State Department of Highways have standardized certain shapes for specific purposes. These shapes should not be used for other purposes along highways where they would cause confusion.

- a. The DIAMOND is used for most warning signs.
- b. The RECTANGLE, with the longer dimension vertical, is used for most regulatory signs and some warning signs.
- c. The PENTAGON, with point up, is used only for School and School Crossing signs.
- d. The PENNANT, with the longer dimension horizontal, is used only for No Passing Zone warning signs.
- e. The OCTAGON is used only for STOP signs.
- f. The EQUILATERAL TRIANGLE, with the point down, is used only for YIELD signs.
- g. The ROUND shape is used for Railroad Advance warning signs and for Civil Defense Evacuation Route signs.

2. **Colors.**—Two different color definitions are used in various portions of this manual. These systems are based on the two most common color reproduction systems used in the printing industry, which are centered on the ubiquitous Pantone Matching System (PMS) of colors.

The first of the two systems would be used for signs that utilize only a few individual colors in their design. This system is based on Pantone spot color definitions, where several thousand different colors have a specific and unique number assigned to them. In this system, every color in the palate can be described and ordered by using this number. Different colors are achieved by mixing a limited number of standard colors which when combined form the desired color. This color is then applied in a solid coat. This is the technique generally employed to produce the thousands of colors available at retail paint stores. If a color is defined in this manual by a PMS number, such as PMS 607U, that definition is based on this palate and the color would be achieved by mixing base colors at a paint supplier.

The second of the two systems would be used for signs that utilize many different colors in their design. This system is based on the Pantone system of process colors, where every color in the design is made up of a mixture of four process colors, all of which are applied in different percentages at the same time to the design. The four process colors are: cyan, magenta, yellow, and black, and this method of reproduction is often referred to in shorthand form as the CMYK. With the exception of silk screening, this is the system used when mechanical or electronic production methods are used to produce signs. Generally, it is not intended for signs designed to be hand colored using individual colors of paint. If a color is defined in this manual using CMYK percentages, then the definition is based on this palate, and the color would normally be achieved by using mechanical or electronic reproduction instead of mixing colors at a paint supplier.

The two palates are related, and colors can normally be translated from one system to the other, usually with good results. All of the colors in the Pantone spot color book can be mixed fairly accurately using combinations of cyan, magenta, yellow, and black, plus white (remember this system was originally developed by the printing industry where white paper is generally used). Conversely, colors that are described with CMYK values can often be matched closely with solid colors from the Pantone spot color palate.

- a. Standard colors for most Reclamation signs shall equal the PMS. Care should be taken to choose standard paints that can be matched to the PMS. If the paint chosen is not equivalent to a Pantone color specified in table 3, a visual or a computer generated match should be made. Stains typically do not have Pantone color equivalents; therefore, a visual or computer generated match will have to suffice for obtaining equivalents for Olympic Stain 707, 713, and Sherwin Williams, Spice Wood, solid stain.

Table 3.—Pantone, CMYK, and Old Pratt and Lambert Comparison Chart

As listed in July 1998 Guidelines	Current or new No.	Pantone equivalent	CMYK
Pratt and Lambert, Alaskan Blue, B763W	Alaskan Blue, 1243	2905U	43,6,0,0
Pratt and Lambert, Congo Brown, 0229A	Congo Brown, 2065	469U	0,51,94,60
Pratt and Lambert, Spectrum Brown, R0187A	Spectrum Brown, 2006	1685U	0,69,100,43
Pratt and Lambert, Black Coffee, R146A	Black Coffee, 2033	4695U	0,79,100,72
Pratt and Lambert, Deep Charcoal, B755A	Deep Charcoal, 2236	532U	100,83,76,0
Pratt and Lambert, Amber White, YG470W	Amber White, 1615	607U	0,0,11,0
Olympic Stain 707	707	N/A	N/A
Olympic Stain 713	713	N/A	N/A
Sherwin-Williams, Spice Wood, B42N15 (solid stain)	B42N15	N/A	N/A

- b. Special purpose posters that rely heavily on illustrations rather than words to send the message (e.g., fire prevention posters) may use other colors.
- c. Colors used in the Reclamation emblem are:
 - Ultramarine blue
 - Brittany blue
 - Bluebird blue
 - White
- d. Certain colors have been standardized by the Federal Highway Administration for certain traffic control purposes. These colors should not be used on other signs along roadways or close to traffic control signs in ways that would cause the viewer to confuse the nontraffic control signs with the traffic control signs. The principal colors and their uses are:
 - RED – Stop or prohibition
 - BLACK – Regulation
 - WHITE – Regulation
 - ORANGE – Construction and maintenance warning
 - YELLOW – General warnings
 - BROWN – Recreational and cultural interest guidance
 - GREEN – Indicated movements permitted, direction guidance
 - BLUE – Motorist services

- F. Agency Name:** Agency name should be centered at the bottom of the sign. Typeface should be Helvetica Bold or another chosen letter style. Both Bureau of Reclamation and the Department of the Interior will be the same font size, and both should be set in all capital letters. However, Bureau of Reclamation may be set in lowercase, if desired. In other instances, such as office signs, Bureau of Reclamation may **not** be in larger typeface than Department of the Interior. Agency names should not be used on fire prevention regulatory signs, on elongated signs, or on special purpose posters.

When used, the name will be set out in one of the forms shown below:

**UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION**

or

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION**

or

**U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION**

or

**U.S. DEPARTMENT OF THE INTERIOR
Bureau of Reclamation**

- G. Vendor ID:** Vendor IDs should not be permitted on the face of any Reclamation signs.

- H. Reflectorization:** Road and motorized trail signs and other signs intended to be seen at night will be made to reflect the same shape and color both by day and night. Image and portal signs may also be reflectorized if night visibility is needed.

Use engineering grade reflective sheeting for most Reclamation signs. Consider high intensity grade sheeting in unique situations where atmospheric conditions and other factors indicate a need for additional reflection.

- I. Message Formulation:** In formulating the message, use standard (approved) word messages, where applicable. Word legends should be brief, but clearly convey the intended message. The use of symbols on signs is encouraged, provided they clearly convey the intended message.

Sign Guidelines

Under normal driving conditions, there is little time between being close enough to read the sign and passing the sign. Consequently, messages must be short. They should be confined to the essentials (for example, destination or direction).

1. When composing a message, consider the following Guidelines.—

- a. Use no more than four words per message, except where the proper name of a destination is more than four words long.
- b. Use a minimum number of word lines.
- c. Use no more than three lines per message, except where a proper name of a certain size requires more than three lines.
- d. Keep message short by using certain commonly recognized abbreviations (e.g., “Mt.” for “Mount,” “Pt.” for “Point,” “St.” for “Street”). (Do not abbreviate historic proper names (e.g., “Fontenelle” to “Font.,” “Vernal Drains” to “V.D.”))

Pedestrians and those on bicycles and horseback have time to pause and leisurely read sign messages unhurriedly. The rules given above, therefore, do not apply to trail signs. However, the wording of trail signs should be concise. Descriptive text should be relevant and contain only information of general interest.

2. Individual or Group Sign Development.—

- a. ***Planning:*** A sign is a communication tool. It is one of several in a resource specialist’s grab bag. Others are brochures, news releases, websites, direct discussions with a customer or client, radio ads, talks before interest groups, and flyers. These tools should only be used following a communication planning process that identifies both the messages and the intended audience.
 - (1) ***Audience and Message.*** Decide on the audience and the information the audience needs at that particular location.
 - (a) A visitor to a recreation site might wish to know:
 - Length of stay allowed
 - Fees, if any
 - Types of services offered
 - If reservations are needed
 - If pets are allowed
 - Location of trailer dump station
 - Open trails for hiking, horseback riding, or ORVs
 - Restriction on trailer lengths or weight on access roads
 - How to get to the site

(b) An agency may wish to inform visitors about:

- Hazards
- Poisonous snakes
- Emergency phone numbers
- Fee amounts
- Restrictions on firearms
- Restrictions on fires
- Restrictions on pets
- Length of stay limitations
- Protection of the environment
- Historical or interpretive messages
- Traffic regulations

(2) *Alternatives.* A sign is not always the best way to influence visitor behavior. For example, a sign at a campground entrance prohibiting pets is of little use to visitors who have traveled a long distance with their pet to that destination, if that information was not correctly available to them in some form before leaving home. Rather, it would be counterproductive to an agency's intention to provide high-quality service to its clients.

A brochure or map can often convey information more effectively. The information may be very general, or very broad, in geographical coverage and may help the visitor when making long-range plans to use a Reclamation facility.

Campground bulletin boards may be used to display information sheets. Information sheets are easily developed, inexpensive, 8.5- by 11-inch sheets of paper that contain important information about an area. This may be a small site-specific map, a hiking trail map, a list of safety concerns, or a description of environmental cautions.

Brochures and recreation guides that include pictures as well as words are other effective communication tools that can be provided to public land users well in advance of departure for their Federal land destination.

New releases can reach a large urban audience with a desired message. However, the newspaper editor or radio/TV news director must decide if it is newsworthy. Also, if used, the news release may be edited to such a degree that it no longer serves the agency's intended purpose.

Physical controls such as barriers and fences, used to warn visitors to stay on roads, may preclude the need for signs within a given area.

Signs that are part of an enforcement effort usually must be backed up by some administrative action. Thus, a sign giving notice of a restriction or closure does not, in itself, legally create an enforceable closure. The public must be given notice of such closures or restrictions through

appropriate, established channels (e.g., posting in a district office or publication in the *Federal Register*). However, most closures or restrictions are not in effect until the area affected is signed or posted.

Reclamation's website < <http://www.usbr.gov> > and the Federal Government's recreation website < <http://www.recreation.gov> > can provide updated information and available phone numbers and e-mail addresses to obtain additional information.

Physical contact by Reclamation employees, volunteers, rangers, and maintenance personnel can be one of the most effective tools for user information and control and may be more helpful than any of the alternatives.

- (3) *Information Zones*. This term refers to the area's initial point of use, where visitors need certain information before proceeding further. There are three zones:
 - (a) **Exterior Zone**. This zone may vary from 1 mile to 100 miles from the use area. Information disseminated here should allow visitors to prepare for their trip to the interior zone. It is in this zone, for example, that information about pet prohibition at a particular destination should be readily available.
 - (b) **Entrance Zone**. This is the entryway to the destination. Information in this zone should contain most of the warning, controls, hazard identifications, specific use area maps, and fee information.
 - (c) **Interior Zone**. This is the actual destination or point of use. Information within the destination should be minimal and positive. It may include direction signs, restroom signs, campground signs, and other boundary signs. It should not include warning or behavior restriction signs.
- (4) *Message Development*. There are psychological behavior patterns that an agency must consider in developing messages for the public. Those who use the lands as part of their livelihood are driven by important economic considerations. However, most visitors use Federal lands during limited, valuable, nonworking time. Since the visitor is in control of the use of time and space (and expects few or no restrictions over behavior), any restrictions should be reasonable and conveyed in a polite manner.

Within this framework, the user is not open to, or tolerant of, long delays or extensive control. Passive controls placed on visitor behavior must be positive, give assistance, and be supportive; otherwise, users are not receptive to them. Loss of passive control, or a rebellion against it, will likely require mandatory enforcement. That brings into play conflict and confrontation.

In determining message content on signs and other communication tools intended to control or direct visitor behavior, the resource specialist should answer the following questions:

- (a) What is the purpose of the sign or poster? What problem is it trying to solve?
- (b) Who is the intended audience? What do they know about this particular situation?
- (c) What do we want that audience to do, feel, think, or know after seeing the sign?
- (d) What traits of the audience should be considered in developing the sign? What language do they speak? Are there cultural considerations? Are there communication disabilities to be considered?
- (e) What is the message to be given to the target audience?

In developing messages on signs and other communications tools, resource specialists should strive to achieve the following:

- (i) Be positive in approach, uniform in application, and minimal in the quantities of signs produced.
- (ii) Review the message from the visitor's viewpoint: Does it answer the questions? Does the message provide a solution to the visitor's problem or dilemma? Is there sufficient interest for all the information? Is all the information necessary?
- (iii) Keep messages on signs to a single subject. Use two signs to avoid mixing unrelated messages.
- (iv) Keep the message simple, clear, and straightforward.
- (v) Threatening or shocking messages do not necessarily encourage compliance. Use them only in extreme situations, such as where life-threatening hazards exist.

- J. Message Determination:** Before a sign can be laid out, the length of the message and the sign size have to be determined. The Table of Letter Widths and Spacing Guide in appendix 4 provide the units for the width of every letter and the spacing between the letters. The sum of these units is to be multiplied by the letter size factor described in appendix 4. The result represents the length of the word, in inches.

A simple example will illustrate the procedure: a component sign for a marina with a symbol is discussed below (see page 51 for reference.)

Sign Guidelines

1. **First Step.**—Marina is a one-line component sign. The word “marina,” according to the rules of capitalization, is spelled in lowercase letters.

The table of letter widths gives the following values:

m - 39	
a - 26	
r - 22	
i - 15	
n - 27	
a - 26	
<hr/>	
Total	155

2. **Second Step.**—The spacing guide provides the following distances:

between m and a - 3	
a and r - 3	
r and i - 3	
i and n - 3	
n and a - 3	
subtotal 15	
<hr/>	
Total 155 + 15 = 170	

3. **Third Step.**—The sign location calls for a 4-inch-high letter.

The letter size factor is 0.1896.

4. **First Partial Result.**—The word “marina” in 4-inch lowercase letters measures (170 x 0.1896 = 32.232), which is approximately 32-1/4 inches long.
5. **Fourth Step.**—The symbol size for “25 mph” is 12 inches.
6. **Fifth Step.**—The guide to horizontal spacing specifies a distance of one primary message lowercase letter height.
7. **End Result.**—The total message measures:

$$\begin{array}{rclclcl} 32\text{-}1/4 \text{ inches} & + & 4 \text{ inches} & + & 12 \text{ inches} & = & 48\text{-}1/4 \text{ inches} \\ (\text{word}) & & + (\text{space}) & & + (\text{symbol}) & & \end{array}$$

- K. **Sign Size Determination:** The size of the message is now established. Vertical and horizontal margins and, in the case of multiline messages, line spacing must be added. These are specified under the Spacing Guide (see page 50). Positioning of lines, arrows, and symbols is also found in the Spacing Guide.

At this stage, a layout at scale of 1 inch to 1 foot will be drawn up with all elements, including minimum margins. In the earlier example of the “marina” sign, the Spacing Guide stipulates minimum horizontal margins of one lowercase primary message height, both left and right. The lowercase height of the example was 4 inches. Thus,

$$\begin{array}{ccccccc} 4 \text{ inches} & + & 48\text{-}1/4 \text{ inches} & + & 4 \text{ inches} & = & 56\text{-}1/4 \text{ inches} \\ (\text{margin}) & + & (\text{message}) & + & (\text{margin}) & & \end{array}$$

the minimum width of the sign required.

The Spacing Guide for vertical margins stipulates that a space be allowed between the top edge of a sign and a symbol or message. The space should be equal to 1-1/2 primary lowercase letter height above the message or one-third the symbol height above the symbol, whichever creates the greater total sign height. Thus, for vertical margins:

4-inch margin
12-inch symbol (4-inch letters with arrow)
4-inch margin
20 inches is the minimum height required for the sign

The approximate measurements of the sign are 4 feet, 8-1/4 inches wide by 1 foot, 8 inches high. The layout is now complete. Even though the above example refers to a simple situation, more complex ones follow the same pattern.

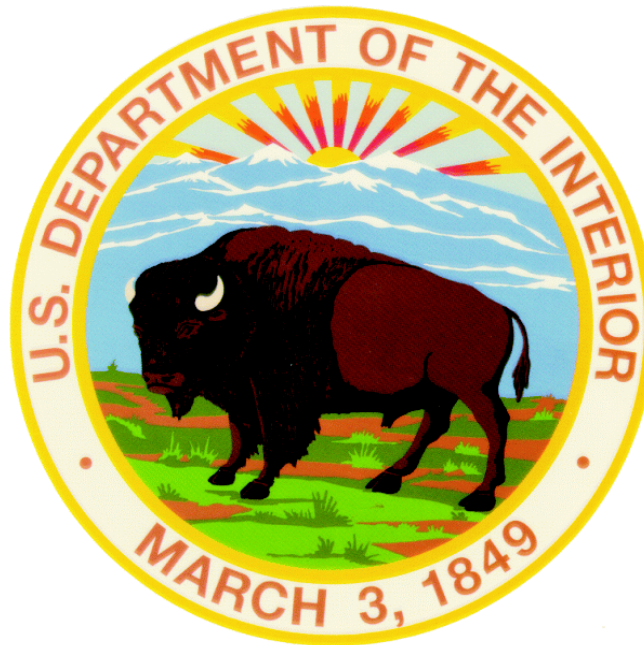
- L. Symbols/Seals/Emblems:** The Federal International Symbol System will be adopted by Reclamation to supplement its sign program (see appendix 5). Appendix 5 does not include all the international symbols that are available. Additional symbols can be viewed by accessing the Bureau of Land Management’s website at <http://lm0005.blm.gov:80/gis/narsc/intersymboldump.html>. It will be the option of the operating office coordinator to determine whether to use symbols and worded messages together on the same signs. Interior seal and Reclamation emblem are to be used where indicated in these Guidelines. Metal seals/emblems are recommended for outdoor use.

If a reservoir logo has been developed and is consistent with reservoir brochures and other published material, placement of the reservoir logo should be graphically incorporated along with other symbols/seals/emblems, where appropriate.

Color Guide

U.S. Department of the Interior Seal

March 2002



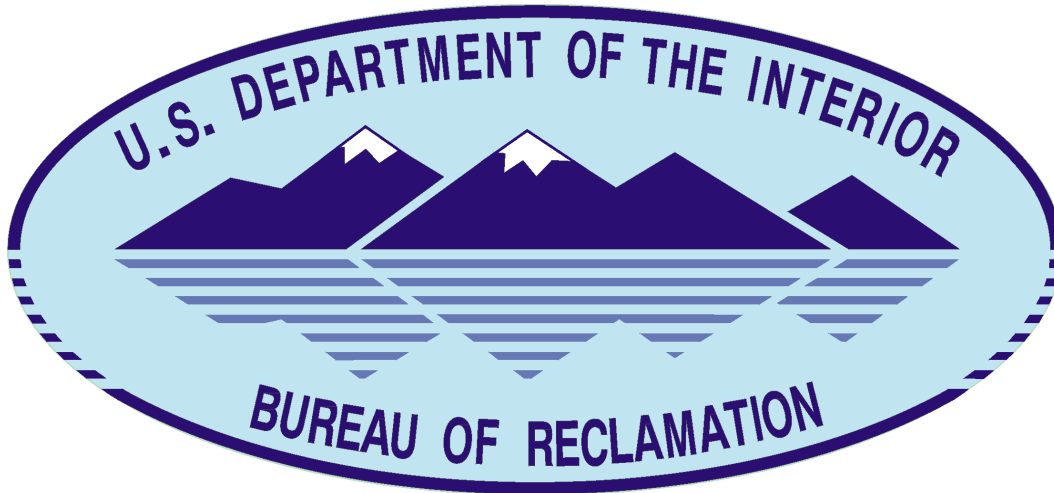
Seal Element	Color	Cloth	Fed. Std.	PMS	CMYK
Destination Band	White	67101	27886	White	0, 0, 0, 0
Inner/outer borders and bullets	Golden Yellow	67104	13655	116	0, 15, 94, 0
Letters and numbers	Gold Brown	67194	10115	471	0, 56, 100, 18
Sky	Forget-Me-Not Blue	67168	25526	304	30, 0, 6, 0
Sun	Golden Yellow	67104	13655	116	0, 15, 94, 0
Rays (alternating from sun)					
Inner	Scarlet	67111	11105	200	0, 100, 65, 15
Middle	Golden Orange	67100	Mix to match	137	0, 34, 91, 0
Outer	Golden Yellow	67104	13655	116	0, 15, 94, 0
Mountains	Old China Blue	67169	25177	543	56, 15, 0, 6
Snowcaps	White	67101	27886	White	0, 0, 0, 0
Grass shaded	Green	67129	14110	364	72, 0, 100, 43
Grass shaded	Emerald Green	67128	14187	368	65, 0, 100, 0
Dirt	Gold Brown	67194	10115	471	0, 56, 100, 18
Bison	Brown	67136	10091	181	0, 72, 79, 47
Details	Black	67158	17038	Black	0, 0, 0, 100
Horns	White	67101	27886	White	0, 0, 0, 0
Outlines	Black	67138	17038	Black	0, 0, 0, 100

The seal can also be printed black on white or white on black.

Color Guide

Bureau of Reclamation Emblem

March 2002



Emblem element	Color	Cloth	Yarn	Fed. Std.	PMS	CMYK
Border, mountains, letters	Ultramarine Blue	65010	67118	None	Reflex Blue	100, 72, 0, 6
Background	Brittany Blue	80130		15526	551	30, 0, 0, 15
Mountain reflections (lines)	Bluebird Blue	70211		15092	542	76, 23, 0, 9
Snowcaps	White	65005		17925	White	0, 0, 0, 0

The emblem can also be printed black on white or white on black.

The emblem colors are specified in paragraph E.2.c. (above). One-color versions may also be used. If a one-color version is used, the emblem can only be used in the positive form. If the emblem is to be used against a dark background in which the emblem border would be lost, the emblem should be superimposed on a white oval, so the emblem border will stand out.

1. **Seals/Emblems.**—Signs and posters may carry both the Interior seal and Reclamation emblem. They must be either vertically placed in the upper, left-hand corner (Interior above, Reclamation below) or set independently on either side of the sign in a convenient location (Interior left, Reclamation right). Refer to Design Types B_{1a} and B_{1b}.
 - a. On fire prevention regulatory signs, only the Reclamation emblem should be used. It should be placed in either the lower left or lower right corner, (preferably the lower right).

Sign Guidelines

- b. On special purpose posters, only the Reclamation emblem should be used. It should be placed in the lower, right-hand corner. A “reversed” or negative emblem will not be used. Instead, use the positive emblem on an oval patch of white, slightly larger than the emblem.
 - c. On elongated signs, the Reclamation emblem should be used alone in a boxed area at the top or the bottom of the sign.
 - 2. **Agency Identification.**—The standard Reclamation emblem is the only symbol used to identify the Bureau of Reclamation. It must not be modified. Use the Reclamation emblem on all entrances to designated locations on Reclamation lands. Identify Reclamation as an agency of the Department of the Interior.
- M. Letter Styles:** The letter styles selected for most Reclamation signs are Ancient Egyptian and Helvetica Medium; however, each office may select letter styles and a typeface that meet their individual needs. The only exceptions are standard roadway signs that will conform to MUTCD standards and interpretive signs that will be established during the planning phase of development. If signs are provided in conjunction with other agencies, their choice of letter styles should be taken in consideration. Most signs will use Ancient Egyptian letter styles, particularly major and minor identification signs. Signs requiring a large number of words, such as information signs, can be lettered with Helvetica Medium. Sans serif lettering with consistent stroke width is easier for people with visual impairments to read. In situations where it is imperative that a message be communicated, sans serif should be used.
- 1. **Typeface.**—Helvetica, Roman, Bold, Italic, and other forms may be used. Italic is to be used sparingly and for special effect.
 - 2. **Upper and Lowercase.**—Use of normal upper and lowercase letters throughout the sign is preferred. All uppercase will be used only for sign headline copy and for special emphasis. In all cases, body copy will follow normal upper and lowercase rules.
 - a. **Typeface:** Several additional typefaces commonly used on Reclamation signs are or could be:
 - (1) **News Gothic Bold.** A sans serif typeface comparable to the Helvetica Bold, but less heavy stroke. Used primarily on administrative, information, and road direction signs. Used to spell out United States Department of the Interior and Bureau of Reclamation. Used as body type for sign message.
 - (2) **Souvenir Demi.** A moderate, serif, italic typeface.
 - (3) **Helvetica.** A strong, easily read, sans serif typeface.

- (4) **Egyptian.** Easily read letter style that can be used on major identification signs.

N. Signposts and Bases: Where applicable, signposts used on standard highway regulatory, warning, and directional signs should be made of treated, 4- by 6-inch Douglas fir or redwood. Breakaway-type mounting posts should be considered, when feasible. A single post should be used for signs up to 3 feet in length and double posts for signs more than 3 feet long. Signs should be attached to posts in a manner that does not interfere with message legibility, while remaining easily removable for maintenance. When signs are mounted on dams, buildings, or other structures, the need for posts will be eliminated. The signs should be bolted to the structure, allowing a space of several inches between the back of the sign and the wall face to give the sign a raised appearance.

For signs located within or immediately adjacent to campgrounds and day-use areas that have grills and fire pits, it may be practical to use metal steel or reinforced aluminum for sign supports. In these instances, all metal surfaces should be painted or galvanized.

Identification and interpretive signs should have bases that support the design character of the area. Guidelines for the base height and angle have been established by the Uniform Federal Accessibility Standards and the Americans with Disabilities Act Accessibility Guidelines. However, base designs should be approved by the area office sign coordinator or by the area office sign coordinator in conjunction with the regional sign coordinator and the public affairs officer and, where appropriate, the regional accessibility coordinator.

The location of all signs along roadways should comply with MUTCD standards. The following chart shows the approximate required distance between signs and the required distance of advance warning of directional signs before intersections:

Speed limit	Distance from sign to intersection or between signs (in feet)
20	100
30	150
40	300
50	500
55	750

There are no standards for the location of pedestrian signs, but their physical surroundings play an important role. Pedestrian signs should be highly visible and not obstructed by vegetation or physical features of the area.

Care should be taken to ensure that signs directed to one activity do not interfere with another activity. Safety of the visitor should always be a consideration when determining both the message and location of signs.

Sign Guidelines

- 1. Placement and Installation.**—Uniformity of placement and installation helps users to see the signs and determine where the directed action is to take place. Select locations that maximize the opportunity for the sign to convey its intended message.

- a. **Placement:** As a general rule, with the exception of the “No Passing” pennant, place signs on the right-hand side of the roadway, as close to the standard location as possible. Consider the following Guidelines when selecting sign installation locations:

- (1) Place signs where they provide adequate time for viewer response, considering such things as approach speed, road conditions, etc.
- (2) Select locations that minimize viewing obstructions. Some common placement locations to be avoided, if possible, include:
 - (a) Dips in the roadway or trail.
 - (b) Just beyond the crest of a hill.
 - (c) Where the sign may interfere with the normal operation of the facility.
 - (d) Too close to trees or other foliage that could cover the face of the sign.
- (3) Place the sign within the viewer’s “cone of vision.”
 - (a) As speed increases, driver concentration increases.
 - (b) As speed decreases, driver concentration wanes. At 25 mph, the natural eye focus point lies 600 feet ahead of the car. At 45 mph, it lies 1,200 feet ahead.
 - (c) As speed increases, the driver’s peripheral vision decreases. On low-speed roads, the signs can be set farther back from the right-of-way and still be visible and effective. At 25 mph, a driver’s “cone of vision” is 90 degrees. At 45 mph, it narrows to 65 degrees; and at 60 mph, it is only 40 degrees.
 - (d) As speed increases, the driver’s ability to focus on foreground detail decreases. At 40 mph, the closest point of clear vision lies 80 feet ahead of the car. At 60 mph, the driver can see clearly only that detail within an area 110 to 1,400 feet in front of the car and within that 40-degree “cone of vision.”
- (4) Guidelines for installation of Warning, Regulatory, and Guide signs on roads are as follows:

- (a) **Height** - The bottom of the sign should be a minimum of 3 feet above the level of the roadway on roads posted for speeds of 30 mph and over. For roads posted for speeds less than 30 mph, the bottom of the sign should be set a minimum of 30 inches above the ground where the sign is being placed.
 - (b) **Lateral Clearance** - The distance from the edge of the roadway to the inner edge of the sign can range from 6 to 12 feet. The normal minimum is 6 feet. In cases where roadside topography precludes the 6-foot minimum, the inner edge of the sign shall be no closer than 2 feet from the edge of a roadway with no shoulder and no closer than 2 feet from the outer edge of a shoulder.
 - (c) **Canting** - Normally, signs should be mounted approximately 93 degrees to the direction of, and facing, those they are intended to serve. This canting helps reduce mirror reflectivity. Sign faces are normally vertical; but on up and down grades, it may be desirable to tilt from the vertical to improve readability.
- (5) Sign coordinators and road engineers should be aware of “sign clutter,” a situation in which new and different signs are added to a location over time, and the overall effect is to force the viewer to wade through a mass of uncoordinated information to obtain that information he needs. “Sign clutter” situations should be reevaluated to combine, redesign, and eliminate signs to reduce the clutter.
- b. **Sign Mounts:** Normally, signs should be individually erected on separate posts or mountings, except where one sign supplements another or where route markers and directional signs must be grouped. Signs should be located so they do not obscure each other and so they are not hidden by other objects.
- (1) *Posts.*
- (a) Posts are used to hold signs in a proper and permanent position and to resist swaying in the wind. Generally, wood or metal posts are used. In areas where sign supports cannot be sufficiently offset from the road edge, use a suitable breakaway or yielding design. Wood posts with less than 24 inches of cross section do not require breakaway design. Concrete bases for signposts should be flush with the ground level.
 - (b) Metal posts should be unpainted galvanized metal. All hardware used to affix signs to either wood or metal posts should be either aluminum or galvanized.

Sign Guidelines

- (c) After a sign is installed, the ends of the bolts should be snipped off and the threads upset or fractured to prevent removal of the nuts by vandals or thieves.
 - (d) The number and size of posts per sign should be proportional to the size of the sign. For signs up to 36 inches across, use one post. For signs ranging from 37 to 72 inches across, use two posts. From 72 inches to 96 inches across, use three posts.
- (2) **Massive Bases:** Reclamation's large administrative/portal/entry signs should be mounted on bases that match the size and mass of the sign, as well as complement the surrounding landscape. These bases are normally located outside the roadside recovery area, usually at least 30 feet away from the edge of the roadway travel surface or off the highway right-of-way. Three basic kinds of bases are:
- (a) Rock base.
 - (b) Brick base.
 - (c) Wood skirt base.

O. Determination of Letter Size: The letter size for signs is determined by the maximum allowable vehicle speed at that point of the road system. The letter size for pedestrian signs is determined by location, volume, and type of visitors using the area, rather than by speed. If people with disabilities are using the sign message, letter point size should comply with accessibility guidelines. To be easily read, the sign should have sufficient color contrast between letters and background.

The following speed rules pertain to the sign's primary message only. Letter size for a sign's secondary message will be two-thirds the height of the primary message. (Refer to design procedure for each sign category for primary/secondary identification.)

1. Roads.—

- a. Speed: 46 mph to 60 mph; lowercase height and thickness of arrow shaft, 8 inches; 18-inch recreation symbols.
- b. Speed: 36 mph to 45 mph; lowercase height and thickness of arrow shaft, 6 inches; 18-inch recreation symbols.
- c. Speed: 25 mph to 35 mph; lowercase height and thickness of arrow shaft, 4 inches; 12-inch recreation symbols.
- d. Speed: 24 mph or less; lowercase height and thickness of arrow shaft, 3 inches; 12-inch recreation symbols.

2. Pedestrian and Trail Signs.—

- a. Short messages to be read from some distance: lowercase height and thickness of arrow shaft, 2-1/2 inches.
- b. Direction, distance, instructions, listings in moderate visitor use areas where pedestrian traffic is channeled by walks, etc.: lowercase height and thickness of arrow shaft, 2 inches.
- c. Plaques, markers, and object identification: capital height, 1-1/2 inches; lowercase height and thickness of arrow shaft, 1 inch; 8-inch recreation symbol.
- d. Description sign texts: capital height, 1 inch; lowercase height and thickness of arrow shaft, 5/8 inch; 8-inch recreation symbol.

The Guidelines for letter and space size may be adjusted to meet special conditions, such as composition, emphasis, and so forth. Never should sizes be less than those indicated in the charts for particular uses or speeds. As a rule, 1 inch of letter height can be read from a distance of 50 feet; 2 inches from 100 feet, and so on.

P. Rules for Capitalization:

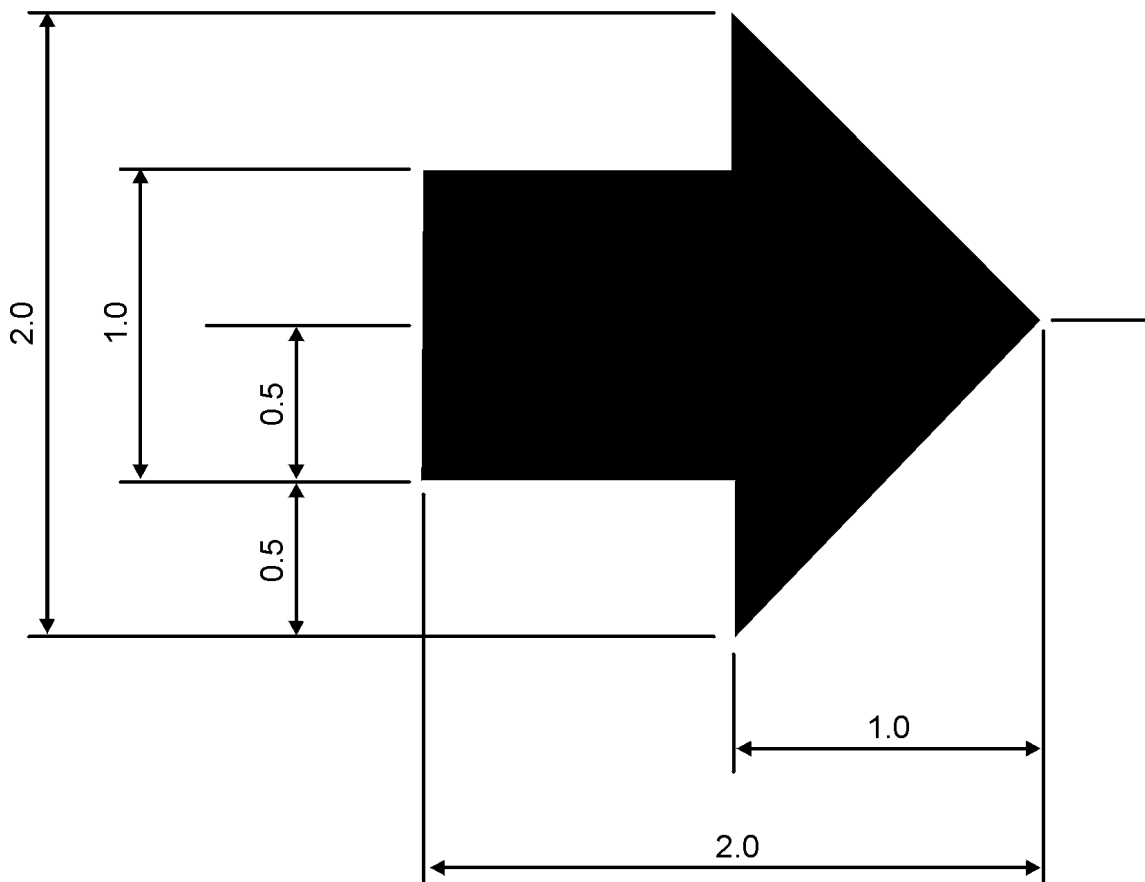
1. Signs should use both uppercase and lowercase letters. The first letter of all proper nouns should be capitalized.
2. Identification signs should use uppercase and lowercase letters (example: “Aspen Grove Campground, Upper Colorado Region”). The Department of the Interior and Bureau of Reclamation designations shall be spelled with all capital letters.
3. Informational signs should use uppercase and lowercase letters.
4. Directional signs should use uppercase and lowercase letters.
5. Regulatory/warning signs should follow MUTCD standards.
6. Temporary signs should follow the rules set forth in the category to which they belong.
7. Concessionaire signs should follow all applicable rules set forth above.
8. Boating signs and snowmobile signs should follow the rules set forth in the Uniform Waterways Marker System and the National Snowmobile Association Standards.
9. No specific guidelines have been established for interpretive signs. However, the format should conform to the overall interpretive program.

Q. Spacing Guide:

1. **Arrows.**—Arrows can be used to point in four directions: straight up, straight down, straight left (90 degrees), and straight right (90 degrees).

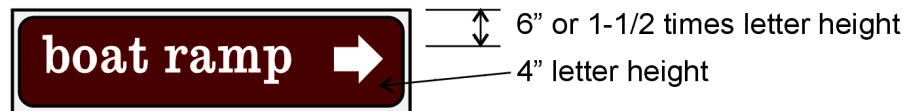
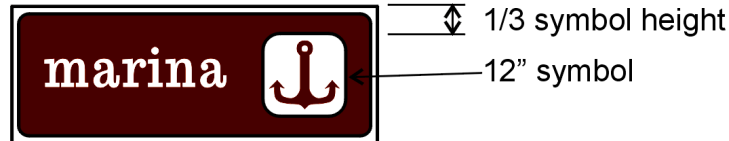
Arrows are to be positioned either to the right or left of the message or symbol so that the arrow is pointing away from the message or symbol, rather than to it. On trail signs for pedestrians, which contain long listings of directions, the arrow may be placed above or below the message for greater clarity. If, at certain locations, a narrow sign is preferred, and the position of an arrow to the right or left of the message requires an excessively wide sign, the arrow may be placed below the message.

Arrows will conform to these proportions:

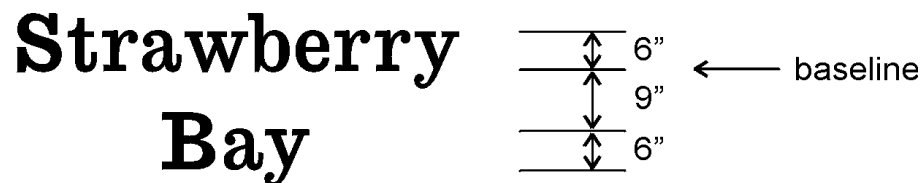


2. Minimum Vertical Spacing.—These proportions apply to all signs except Design Types A and B.

- a. Between the top edge of a sign and a symbol, arrow, or message, allow space equal to 1-1/2 primary lowercase letter height above the message or one-third the symbol height above the symbol, whichever creates the greater total sign height.



- b. Between baseline of first line and top of second line of primary message, allow space equal to 1-1/2 primary lowercase letter height.



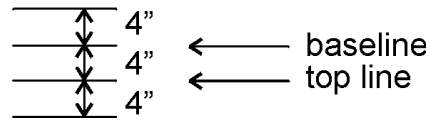
- c. Between baseline of primary message and top line of a secondary message, allow space equal to one primary lowercase letter height.



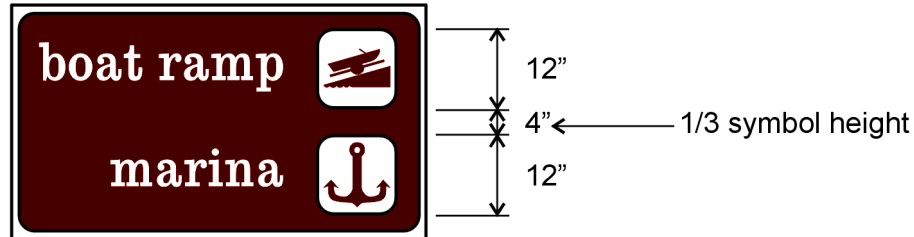
Sign Guidelines

- d. Between baseline of a secondary message and top line of the second line and each succeeding line of a secondary message, allow space equal to one secondary lowercase letter height.

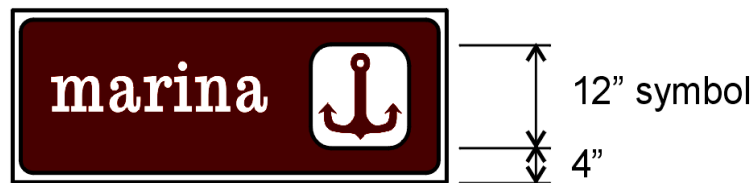
**day use
area**



- e. Between the bottom edge of the top symbol and top edge of lower symbol, allow space equal to one primary lowercase letter height or one-third symbol height, whichever is greater.



- f. Between the bottom edge of the lowest symbol or message, allow space equal to 1-1/2 primary lowercase letter height below the message or one-third the symbol height below the symbol, whichever creates the greater total sign height.



- g. Signs with a symbol or arrow to the left or right of the message will have the message centered vertically on the symbol or arrow.

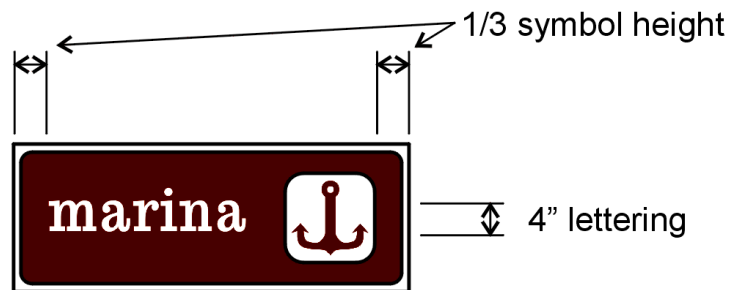


- h. In a two-line message, the arrow should be vertically centered between the two.

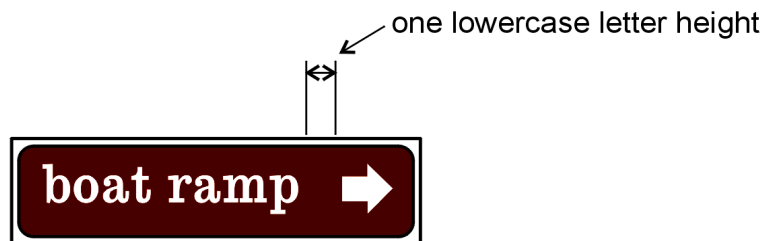
**Chicken Creek
Campground** ➔

3. Minimum Horizontal Spacing.—These proportions apply to all signs except Design Types A and B.

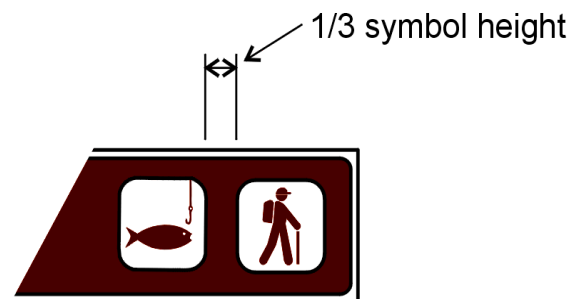
- a. Between the left and right edge of the sign and the message, arrow, or symbol, allow space equal to 1-1/2 lowercase letter height or one-third symbol height.



- b. Between the first and last letter of a message and an arrow or symbol, allow space equal to one lowercase letter height or one-third symbol height.



- c. Between symbols, allow space equal to one lowercase letter height or one-third symbol height.



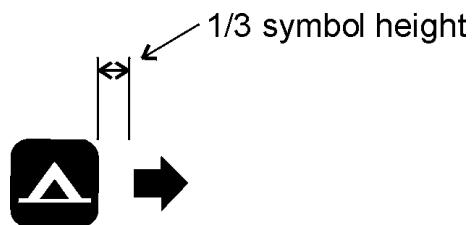
Sign Guidelines

- d. Symbols placed beneath or above a message will be centered on the message.

day use area



- e. Between symbols and arrows on signs with no written message, allow a space equal to one-third symbol height between them and center the arrow vertically on the symbol.



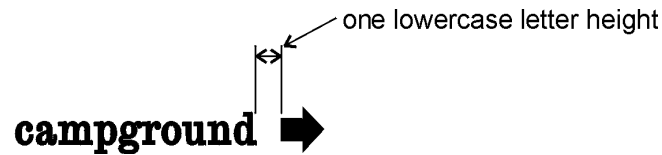
- f. Between words in a primary message, allow space equal to one primary lowercase letter height.

Sage Grouse

- g. Between words in a secondary message, allow space equal to one secondary lowercase letter height.

recreation area

- h. Arrows should be aligned with baseline of appropriate message, allowing a space equal to one lowercase letter height between arrow and baseline.



- i. All margins are measured from the outside of the sign face.
- j. **Borders:** Signs that require borders, except Design Type A₁, should typically have a white border set in 1/4 inch from the edge of the sign face; however, different border colors may be used as necessary for interpretative signs, etc., depending on the background colors. Line weight should be appropriate to the size and overall design of the sign. Corners should be slightly rounded to match the sign. Borders on elongated signs and posters should be square. Borders should be used on fire prevention regulatory signs and posters but are not required on special purpose posters.

The width of the border should be determined by the width of the sign. The border width should be 3/16 inch for each foot of sign width. Corner radii for the border should be 1 inch per foot of sign width. In no case should the border be less than 3/8 inch wide. For signs that have routed borders, a 1-inch offset from the edge of the sign face is recommended to prevent chipping.

- R. **Sign Materials:** Reclamation signs and posters can be manufactured from a variety of materials, including wood, metal, plastic, fiberglass, and cardboard. These materials are called "substrates." The "message" is either painted or printed (usually by silk screening) onto the substrate. Other materials commonly used in the manufacturing process include reflective sheeting, paint, stain, and vinyl edge film.

As a general rule, the softer or more porous a substrate material is, the better paints will penetrate the surface and create a solid bond. The harder or more slick the material, the more likely the paint is to dry on the surface. The softer substrates are more easily damaged from deep gouging by vandals. The harder substrates are more likely to resist gouging and destruction of the substrate, but the paint is more easily chipped away.

The harder and less porous the surface, the better decals and pressed-on vinyls will adhere.

Sign Guidelines

Some commonly used substrates for Reclamation signs are:

1. **High-Density Overlay (HDO) Plywood.**—Marine-quality, 3/4-inch plywood with one side covered with a high density, slick material (the overlay), to which adhesives cling quite strongly. Commonly used as the substrate for pressed-on materials such as reflective vinyl. This substrate should be used extensively for the larger signs. It weathers well, and holes in the vinyl can be easily repaired.
2. **Medium-Density Overlay (MDO) Plywood.**—Marine-quality, 3/4-inch plywood, with one side covered with a smooth but more porous overlay than HDO. This substrate accepts paint much better than HDO. The porosity of the overlay allows the paint to bond with the substrate better.
3. **Medium-Density Fiberboard (MDF).**—A pressed-particle board product that accepts paint (silk screening) very well and weathers well. MDF is gaining adherents among transportation departments for large highway signs (green, blue, and brown).
4. **Plastics.**—Sign making can involve a variety of plastics:
 - Acrylic, or Plexiglas, is a hard, rigid material that withstands abrasion well but breaks easily. It is often used as a clear protective covering over another sign.
 - Polycarbonate, or Lexan, is similar to the acrylic panel but is softer, with a greater flex. Its softness makes it more likely to be marred by dust and blowing sand.
 - Polyethylene and polypropylene are fairly common materials that are suitable for most routine sign applications. They are soft materials that have sufficient rigidity to stand up as small signs, but not so rigid that they are easily broken. They come in basic colors, and accept paint (silk screening) well. Generally, they weather well; however, their softness makes them easy prey to vandals wielding sharp or pointed instruments. Initial and replacement costs are low.
5. **Carsonite®.**—Carsonite is a patented material that combines fiberglass and epoxy resins to make a strong but flexible substrate. Used most often in a thin, vertical format, it is also used for small routine signs. Its hard, impervious surface is best used as a substrate for decals, although silk screening is possible. It is very resistant to impact and weather. Initial and replacement costs are low.
6. **Aluminum.**—A long used, common substrate for routine, smaller signs. Message usually silk screened onto substrate. Easily and significantly damaged by bullets and other forms of vandalism. It has good weather resistance. Medium initial and replacement costs.

7. **Tyvek.**—A fibrous, paper-like material that has good short-term resistance to inclement weather and to animal damage. Very flexible and light. Easily stapled to wood.
 8. **Cardboard.**—A paper product that degrades quickly in inclement weather. Accepts paint (silk screening) well, depending on the slickness of the surface. Easily nailed or stapled. Used primarily for seasonal posters.
 9. **Porcelain Enamel on Steel.**—This material is highly resistant to scratches, impacts, and weathering. Most often used on interpretive signs, it offers a very appealing appearance, but at a high initial and replacement cost. It lends itself well to the use of graphics. While expensive, it has a lifetime of 20 years or more.
 10. **Fiberglass Embedment.**—In this process, a paper image is embedded in a fiberglass/epoxy-resin panel. Preparation of the first paper image is initially a high cost. Second, third, and subsequent copies can be quickly and cheaply made at the time of the original and put aside for later embedment at relatively low cost to replace a damaged or stolen original. The fiberglass resists scratching, impact, and weathering very well.
 11. **Metal.**—Engraved or acid etched metals, aluminum, and stainless steel are often used for signs. Such signs have a long service life, are generally good or very good in their resistance to weather, and fair or poor in their resistance to scratching or impact. Initial cost is generally medium to high, as is the replacement cost.
 12. **Redwood.**—Routed redwood signs have been a Reclamation standard for a long time. These types of signs are expensive because of the high material and fabrication costs.
 13. **High-Density Foam Boards.**—Three-dimensional signs made by cutting a matte and sandblasting to the desired depth. Sand blasting and mattes can also be used to make three-dimensional wood signs from 2-inch-thick material.
- S. **Manufactured Signs:** Specifications for premanufactured signs should be followed per manufacturer's instructions, regardless of the procurement source.

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